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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,853	10/23/2003	Steven M. Arnold	LEW 17,510-1	3668
26311	7590	05/20/2005	EXAMINER	
NASA GLENN RESEARCH CENTER 21000 BROOKPARK ROAD OFFICE OF CHIEF COUNSEL; MAIL STOP 500-118 CLEVELAND, OH 44135			NGUYEN, XUAN LANT	
		ART UNIT		PAPER NUMBER
				3683

DATE MAILED: 05/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/693,853	ARNOLD ET AL.
Examiner	Art Unit	
Lan Nguyen	3683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 02 March 2005.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-11 and 15 is/are pending in the application.  
 4a) Of the above claim(s) 4 and 5 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-3,6-11 and 15 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 09 September 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date, _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 6-11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (USP 6,095,295) in view of Johnston et al. (USP 6,318,522) and further in view of Rosaen (USP 3,448,751).

Park et al. show a magnetorheological device, as in the present invention, comprising: a generally cylindrically shaped housing 113 having cylindrical walls and a divider 115 within said housing; said housing includes an integral end portion 121 and an end plate, not numbered but shown with the bolts on top of figure 1, removably attached to said cylindrically shaped housing; a rotary impeller having a paddle 112 mounted within said housing, said rotary impeller sealingly engaging said divider, said paddle in combination with said cylindrical walls, said divider, said integral end portion of said housing, and said end plate of said housing form a first chamber 116 A and a second chamber 116B, a magnetorheological fluid residing in said chambers; a passageway 125-129 interconnecting said first and second chambers; and, a coil 122 enabling the viscosity of the magnetorheological fluid to be varied, see from column 3, line 67 to column 4, line 11. Park lacks a second paddle in the structure of the rotary

impeller. Johnston et al. teach the concept of varying the number of paddles from one to a multiple of paddles in column 3, lines 2-7. Specifically, Johnston shows in figure 2, a magnetorheological device with 2 paddles 26, 27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Park's magnetorheological device to have comprised two paddles as taught by Johnston to further increase the adjustability of the damping capability of the device. Park shows the coil 122 being located at the end of passageway 125-129 while claim 1 requires the coil to be surrounding a portion of the passageway. Rosaen teaches the concept of surrounding the passageway 18 of the MR fluid with a coil 20 as an effective way to vary the viscosity of the fluid in the passageway to control the flow, see column 2, lines 49-53. It would have been further obvious to one of ordinary skill in the art at the time the invention was made to have further modified Park's device with the coil surrounding the passageway such as taught by Rosaen wherein the magnetic field would be stronger and it would have been a much more effective way to vary the viscosity of the MR fluid as shown by Rosaen.

Re: claims 2 and 3, the Examiner takes an Official Notice that it is old and well known that electric currents can be either a direct current or an alternate current and would have been within a routine for one of ordinary skill in the art to have employed a direct current or an alternate current for use with the coil.

Re: claims 6 and 7, Park shows said passageway is interior to the housing 113 in sections of 128, 129 and exterior to the housing 113 in sections 125-127.

Re: claims 8, 9 and 11, Park further shows a first edge seal 136 extending from said first paddle and would have comprised a second edge seal for the second paddle, as modified; a third inner seal 138 affixed to said integral end portion and a fourth seal 137 affixed to said end plate, as shown.

Re: claim 10, Park shows said passageway 125-129 to be a tortuous path.

Re: claim 15, Park shows magnetorheological device, as in the present invention, comprising: a housing 113 having a divider 115 extending inwardly from said housing, a hub 111 having a first impeller 112 rotatably mounted within said housing; said first impeller straddling said divider, as shown, a first chamber 116A formed by said first impeller and said divider and a second chamber 116B formed by said first impeller and said divider, a passageway 125-129 interconnecting said first and second chambers, magnetorheological fluid in said chambers and said passageway; a magnetic field generated by a coil 122 such that an increase in said field increases the viscosity of the magnetorheological fluid, see from column 3, line 67 to column 4, line 11; said hub and impellers rotatably pushing said magnetorheological fluid against said divider such that said magnetorheological fluid is in compression. Park lacks a second paddle in the structure of the rotary impeller. Johnston et al. teach the concept of varying the number of paddles from one to a multiple of paddles in column 3, lines 2-7. Specifically, Johnston shows in figure 2, a magnetorheological device with 2 paddles 26, 27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Park's magnetorheological device to have comprised two paddles as taught by Johnston to further increase the adjustability of the damping

capability of the device. Note that, as modified, Park's second chamber would be formed by the second paddle and the divider. Park shows the coil 122 being located at the end of passageway 125-129 while claim 15 requires the coil to be surrounding a portion of the passageway and to form a plug. Rosaen teaches the concept of surrounding the passageway 18 of the MR fluid with a coil 20 as an effective way to vary the viscosity of the fluid in the passageway from having no effect in the MR fluid to forming a plug to completely preventing flow in order to control the flow in passageway 18, see column 2, lines 49-53. It would have been further obvious to one of ordinary skill in the art at the time the invention was made to have further modified Park's device with the coil surrounding the passageway such as taught by Rosaen wherein the magnetic field would be stronger and it would have been a much more effective way to vary the viscosity of the MR fluid from having no effect in the MR fluid to forming a plug to completely preventing flow in order to control the flow in the passageway as taught by Rosaen.

#### ***Response to Arguments***

3. Applicant's arguments filed 3/2/05 have been fully considered but they are not persuasive. Applicant argues that Park's and Johnson's devices are operating based on shearing technology wherein the MRF is being sheared through the restricted flow passages of 126-129 of Park and 38 of Johnson; while the instant's invention is operating based on compression technology wherein the MRF is being compressed against a plug in passage 111-114 of the instant invention. Applicant's argument is not

persuasive in that depending on the intensity of the current in the coil, the MRF could comprise a viscosity of slightly thick to forming a plug. Hence, Park's and Johnson's device could form a plug also should the intensity of the current in the coils is strong enough. Therefore, Park's and Johnson's devices are also operating based on compression technology. Furthermore, Park's torturous passage 126-129 is similar to the Applicant's torturous passage 111-114. Should the intensity of the current is strong enough, a plug would be formed in the passage of Park, same as Applicant's. Therefore, Park's device is also operating based on compression technology and not shearing. In Johnson's device, the torturous path is 54, not 38. Johnson specifically states in column 4, lines 17-19 that the gaps 38 and 48 are preferred to be restricted (i.e. sealing chamber 40a, 40d from chamber 40b, 40c). Therefore, Johnson's device is operating based on compression technology and not shearing; since it is preferred not to have any flow in the gaps 38 and 48. However, Johnson is relied upon only for the teaching of the number of paddles in a rotary damper wherein Johnson teaches that it could be one to a multiple paddles; and for having one or more paddles in a rotary damper is a well known knowledge and is within the routine skill of a person in the art. Applicant is correct in that Park's coil is not surround a portion of the passage as claimed. Hence, Rosaen is relied upon to show another well known arrangement of the coil in relation to the MRF in order to affect the viscosity of the fluid. Modifying Park's device with Rosaen's teaching of the arrangement of the coil is reasonable since Park already has the coil, moving it up to surround the passage to provide better effect on the MRF as taught by Rosaen would be obvious to one of ordinary skill in the art to take

advantage of the improvement in effecting the MRF as taught by Rosaen. The rejection is still deemed proper and is repeated above.

***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Nguyen whose telephone number is (571) 272-7121. The examiner can normally be reached on M-F, 8 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor can be reached on (571) 272-7095. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lan Nguyen  
Primary Examiner  
Art Unit 3683

  
5/17/05